2. The process of claim 1, in which the third time interval is about two years and the third time interval commences about two years prior to the date of calculation of the bad rates.

3. The process of claim 2, in which the first time interval is about three months.

4. The process of claim 2, in which the first time interval is about one year.

5. The process of claim 4, in which the one year first time interval coincides with a calendar year.

6. The process of claim 1, in which the second time period is about ninety days.

7. The process of claim 1, in which each loan vintage comprises at least 50,000 loan units.

8. The process of claim 1, further including:

allowing an operator to set the durations of one or more of the first, second and third time intervals;

deploying a general purpose computer for enabling the computer to automatically provide "yes" or "no" comparisons as to whether a given financial institution should choose to invest in a particularly identified loan vintage.

9. The process of claim 1, including:

developing a projection of bad rates for a plurality of said loan vintages by calculating probablistic bad rates for said plurality of loan vintages during a forward looking window extending over a fourth time interval, the projected bad rates comprising an early warning system whose results are depictable on the output medium.

10. The process of claim 9, in which the step of calculating the probablistic bad rates for said loan vintages is carried out by using a logistic regression formula.

11. The process of claim 10, in which the logistic regression formula is

$$\text{Log}(P/(1-P)) = A + (B_1 * \text{AGE}) - B_2 * C0 + B3 * D_1 + B4 * D_2 + B_5 * \text{SCORE} + B_6 * \text{NO SCORE})$$

wherein, P is the predicted bad rate, AGE is defined as the age of the loan vintage and B_1 and AGE are row and

column vectors of a dimension matrix of a predetermined size, SCORE is a mortgage score from a credit bureau and C0, D_1, D_2 and NO SCORE are dummy variables, and the coefficients A, B_1, B_2, B_3, B_4, B_5 and B_6 are estimated by running a model of the equation over a preselected loan portfolio.

12. The process of claim 11, wherein the value C0 is assigned a value of one if the loan is current at the beginning of the third time interval and zero otherwise, the variable D_1 equals one if the loan is one month past due at the beginning of third time interval and is zero otherwise, D_2 is assigned a value of one if the loan is two months past due at the beginning of the third time interval and zero otherwise, and NO SCORE equals one if the loan has no credit score available at the beginning of the third time interval and zero otherwise.

13. The process of claim 10, wherein the fourth time interval is of the same duration as the third time interval.

14. The process of claim 1, wherein the loan units are closed loan units.

15. The process of claim 14, wherein the loans are mortgage loans.

16. The process of claim 1, including separating all loan units into different groups based on type and thereafter carrying out said separation of said loan portfolios into separate loan vintages based on each type of loan.

17. The process of claim 16, wherein the types include conventional loans, jumbo loans and government originated loans.

18. The process of claim 9, including separating all loan units into different groups based on type and thereafter carrying out said separation of said loan portfolios into separate loan vintages based on each type of loan.

19. The process of claim 18, wherein the types include conventional loans, jumbo loans and government originated loans.

20. The process of claim 1, in which the output medium is a graphical chart.

21. The process of claim 9, wherein the output medium is a graphical chart.

22. The process of claim 20, which includes creating the graphical chart by plotting a difference between the bad rates calculated for a preselected pair of loan vintages and including on the graphical chart an area of uncertainty.

23. The process of claim 22, wherein the area of uncertainty is selected as a +1 and -1 standard deviation of the difference in the bad rates for the preselected pair of loan vintages.

24. The process of claim 21, including plotting on the graphical chart the probablistic bad rates in the form of a first curve.

25. The process of claim 9, including developing a matrix link by calculating a bad rate of a preselected loan vintage as of a definite time within the fourth time interval.

26. The process of claim 25, including developing delinquency transition figures for selected ones of said loan vintages.

27. The process of claim 26, including developing the delinquency transition figures by counting the numbers of loans which have transitioned from (a) good to bad state; (b) bad to good state; and (c) a status as a loan.

28. The process of claim 27, further including counting the number of loans which have remained in a bad state and counting loans which have remained in a good state.

29. The process of claim 25, including calculating for at least one of the loan vintages matrix link results comprising a ratio of a predicted number of bad loans divided by a predicted number of new loans.

30. The process of claim 29, including plotting the ratio on the output medium.

31. The process of claim 9, including automatically providing yes/no decisions whether to

invest in selected loan vintages using the early warning system.

32. The process of claim 25, including automatically providing yes/no decisions using the matrix link system.

33. A process for analyzing and selecting loan portfolios, wherein each loan portfolio comprises a plurality of loan units, the process including the steps of:

separating the loan portfolios into a plurality of loan vintages;

developing a projection of bad rates for the plurality of said loan vintages by calculating predicted bad rates for said plurality of loan vintages during a forward looking window extending over a predetermined first time interval, the predicted bad rates comprising an early warning system the results of which are depictable on a visually perceivable output medium, a loan unit being included in the bad rates when payments on the loan unit are in arrears for a time period greater than a second time interval occurring during the forward looking window, the first time interval being substantially longer than the second time interval.

34. The process of claim 33, in which the step of calculating the predicted bad rates for said loan vintages is carried out by using a logistic regression formula.

35. The process of claim 34, in which the logistic regression formula is

$$\text{Log}(P/(1-P)) = A + (B_1 * AGE) - B_2 * C0 - B3 * D_1 - B4 * D_2 - B_5 * SCORE - B_6 * NO\ SCORE$$

wherein P is the predicted bad rate, AGE is defined as the age of the loan vintage and B_1 and AGE are row and column vectors of a dimension matrix of a predetermined size, SCORE is a mortgage score from a credit bureau and C0, D_1, D_2 and NO SCORE are dummy variables, and the coefficients A, B_1, B_2, B_3, B_4, B_5 and B_6 are estimated by running a model of the equation over a preselected loan portfolio.

36. The process of claim 35, wherein the value C0 is assigned a value of one if the loan is current at the beginning of the first time interval and zero otherwise, the variable D_1 equals one if the loan is one month past due at the beginning of first time interval and is zero otherwise, D_2 is assigned a value of one if the loan is two months past due at the beginning of the first time interval and zero otherwise, and NO SCORE

equals one if the loan has no credit score available at the beginning of the first time interval and zero otherwise.

37. The process of claim 33, including depicting graphically in the form of a first curve an expected bad rate curve.

38. The process of claim 37, including producing a bar chart showing current mean bad rates and forecasted mean bad rates and superimposing the first curve over the bar chart.

39. The process of claim 38, including creating the first curve by creating a quarterly bad rate curve, smoothing the quarterly bad rate curve by averaging the values thereof with one another and further smoothing the curve by taking a risk ratio thereof.

40. The process of claim 39, including creating markers on the curves including markers which show the changes in the first curve at a positive to a negative slope transition thereof and markers which show jump points of a predetermined size.

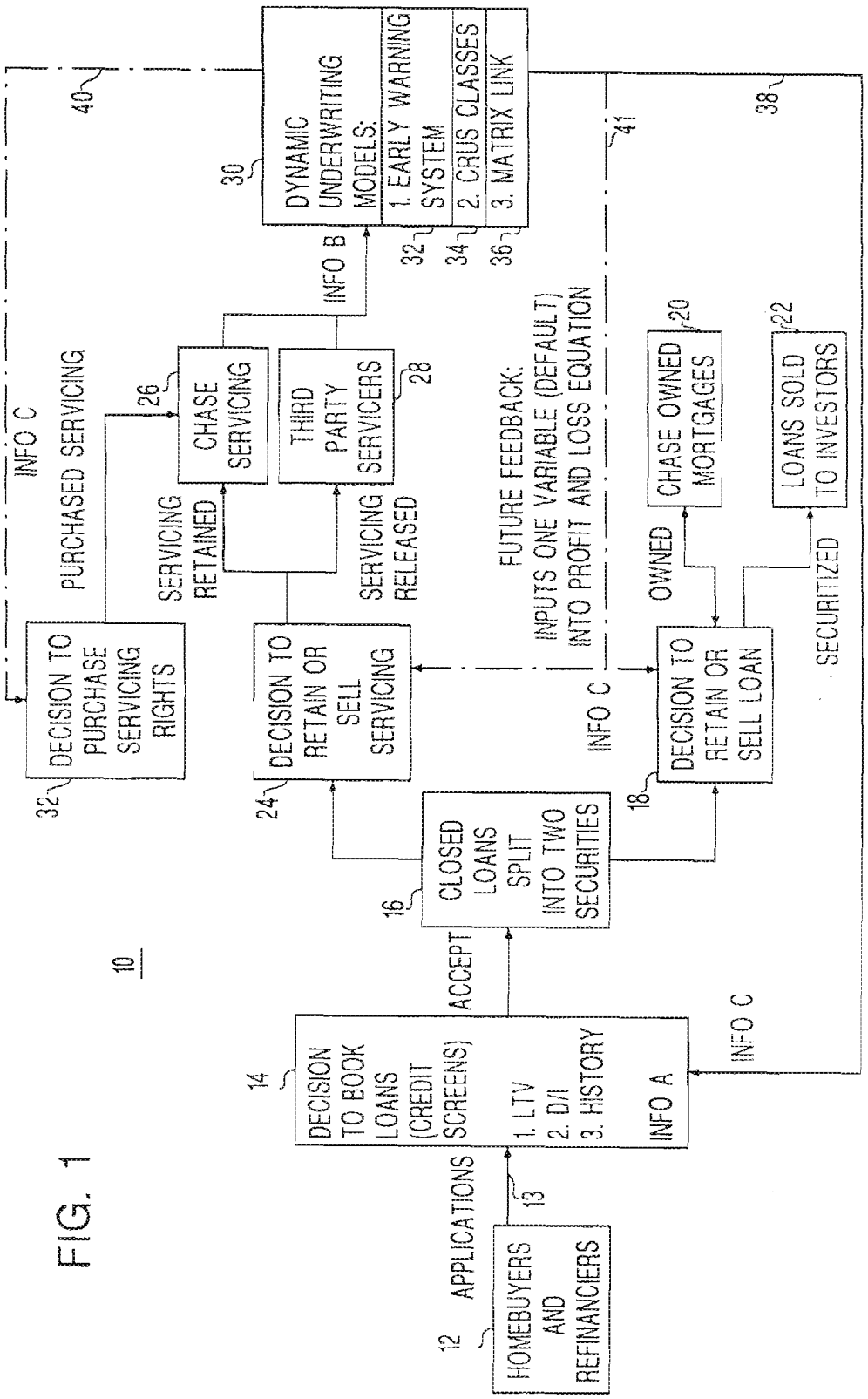

10
HOMEBUYERS AND REFINANCIERS
12
APPLICATIONS
13
DECISION TO BOOK LOANS (CREDIT SCREENS)
14
1. LTV
2. D/I
3. HISTORY
INFO A
ACCEPT
CLOSED LOANS SPLIT INTO TWO SECURITIES
16
DECISION TO RETAIN OR SELL LOAN
18
DECISION TO RETAIN OR SELL SERVICING
24
DECISION TO PURCHASE SERVICING RIGHTS
32
INFO C
PURCHASED SERVICING
SERVICING RETAINED
SERVICING RELEASED
CHASE SERVICING
26
THIRD PARTY SERVICERS
28
INFO B
DYNAMIC UNDERWRITING MODELS:
30
1. EARLY WARNING SYSTEM
2. CRUS CLASSES
3. MATRIX LINK
32
34
36
40
41
38
FUTURE FEEDBACK:
INPUTS ONE VARIABLE (DEFAULT)
INTO PROFIT AND LOSS EQUATION
INFO C
OWNED
CHASE OWNED MORTGAGES
20
SECURITIZED
LOANS SOLD TO INVESTORS
22
INFO C

FIG. 1

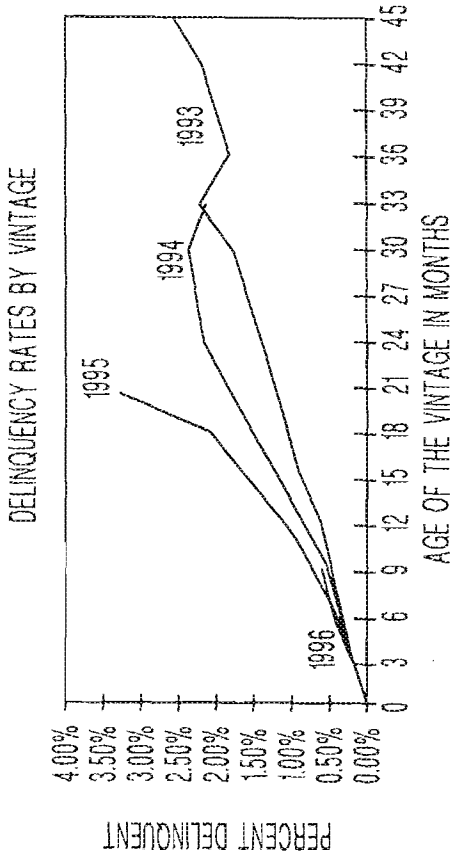

DELINQUENCY RATES BY VINTAGE
PERCENT DELINQUENT
AGE OF THE VINTAGE IN MONTHS
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45
1995
1994
1993
1996

FIG. 1A

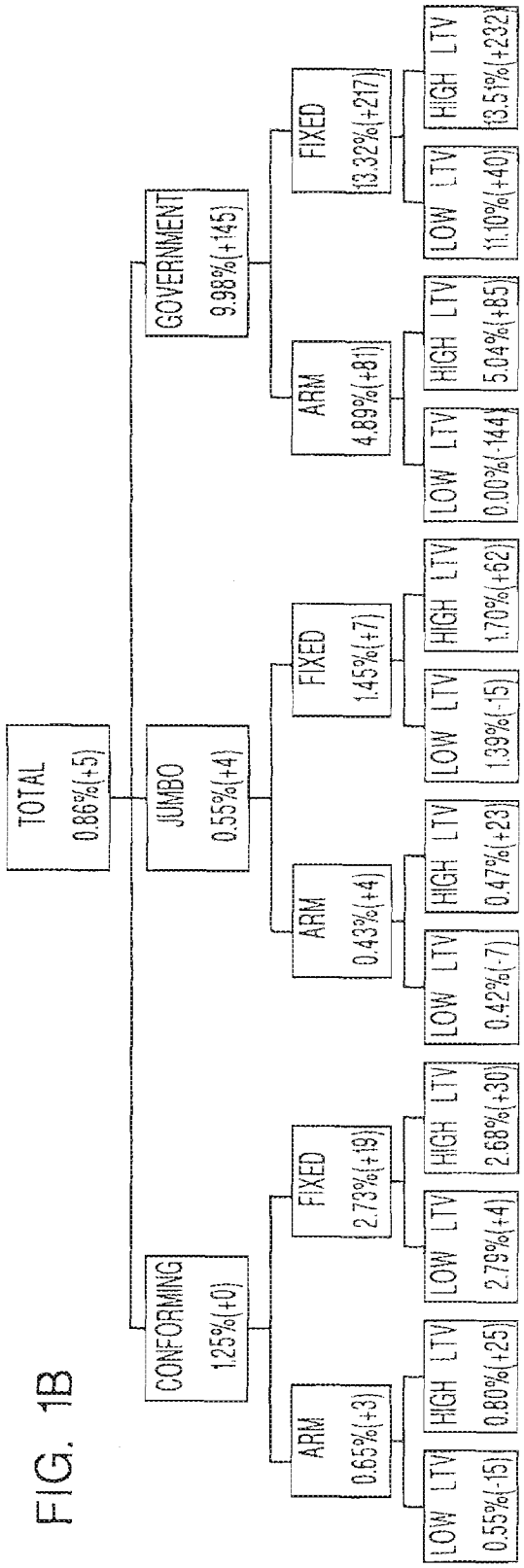

TOTAL
0.86%(+5)
CONFORMING
1.25%(+0)
JUMBO
0.55%(+4)
GOVERNMENT
9.98%(+145)
ARM
0.65%(+3)
FIXED
2.73%(+19)
ARM
0.43%(+4)
FIXED
1.45%(+7)
ARM
4.89%(+81)
FIXED
13.32%(+217)
LOW LTV
0.55%(-15)
HIGH LTV
0.80%(+25)
LOW LTV
2.79%(+4)
HIGH LTV
2.68%(+30)
LOW LTV
0.42%(-7)
HIGH LTV
0.47%(+23)
LOW LTV
1.39%(-15)
HIGH LTV
1.70%(+62)
LOW LTV
0.00%(-144)
HIGH LTV
5.04%(+85)
LOW LTV
11.10%(+40)
HIGH LTV
13.51%(+232)

FIG. 1B

FIG. 2

TRADITIONAL COMPARISON/ HORIZONTAL COMPARISON
AGE OF LOANS IN MONTHS

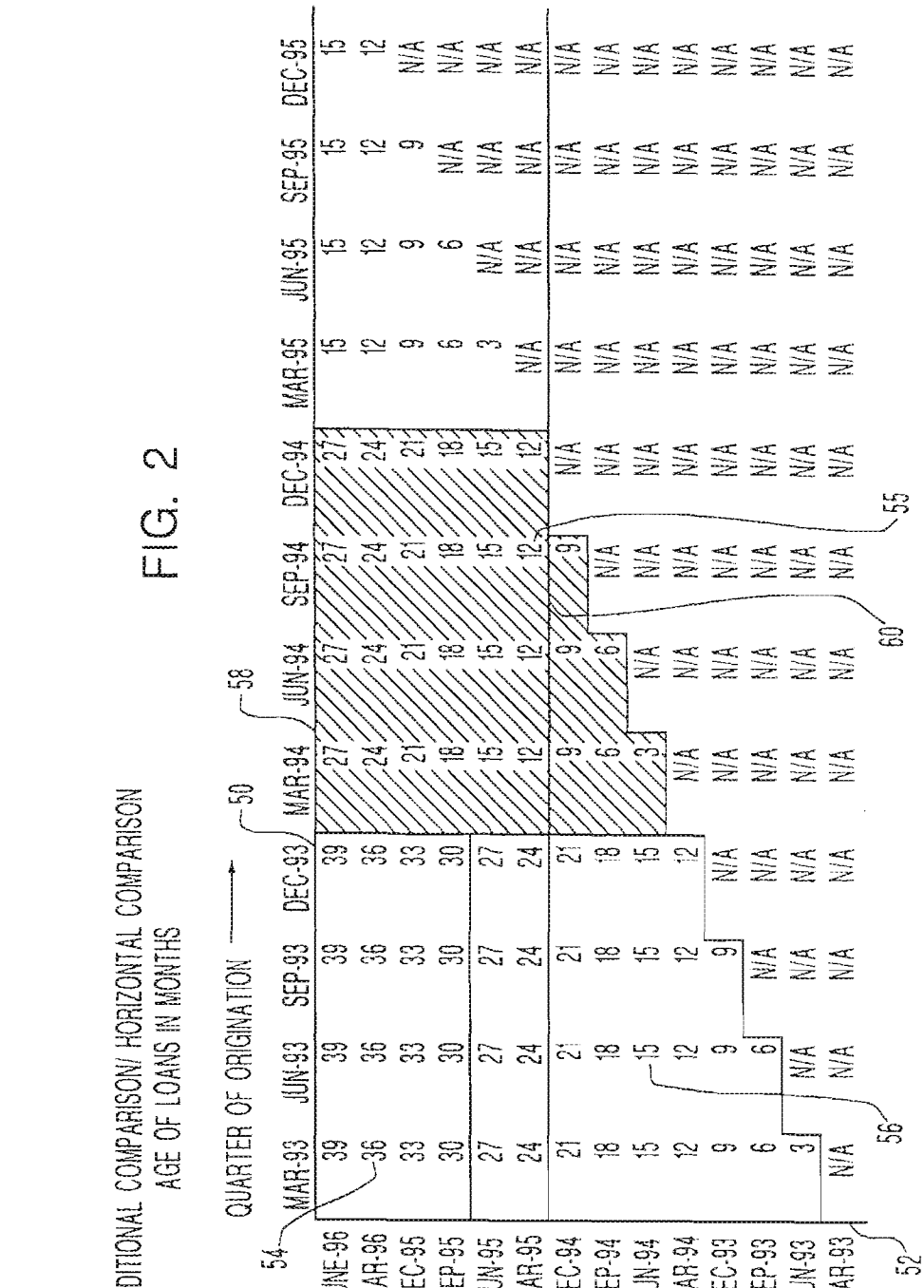


FIG. 3

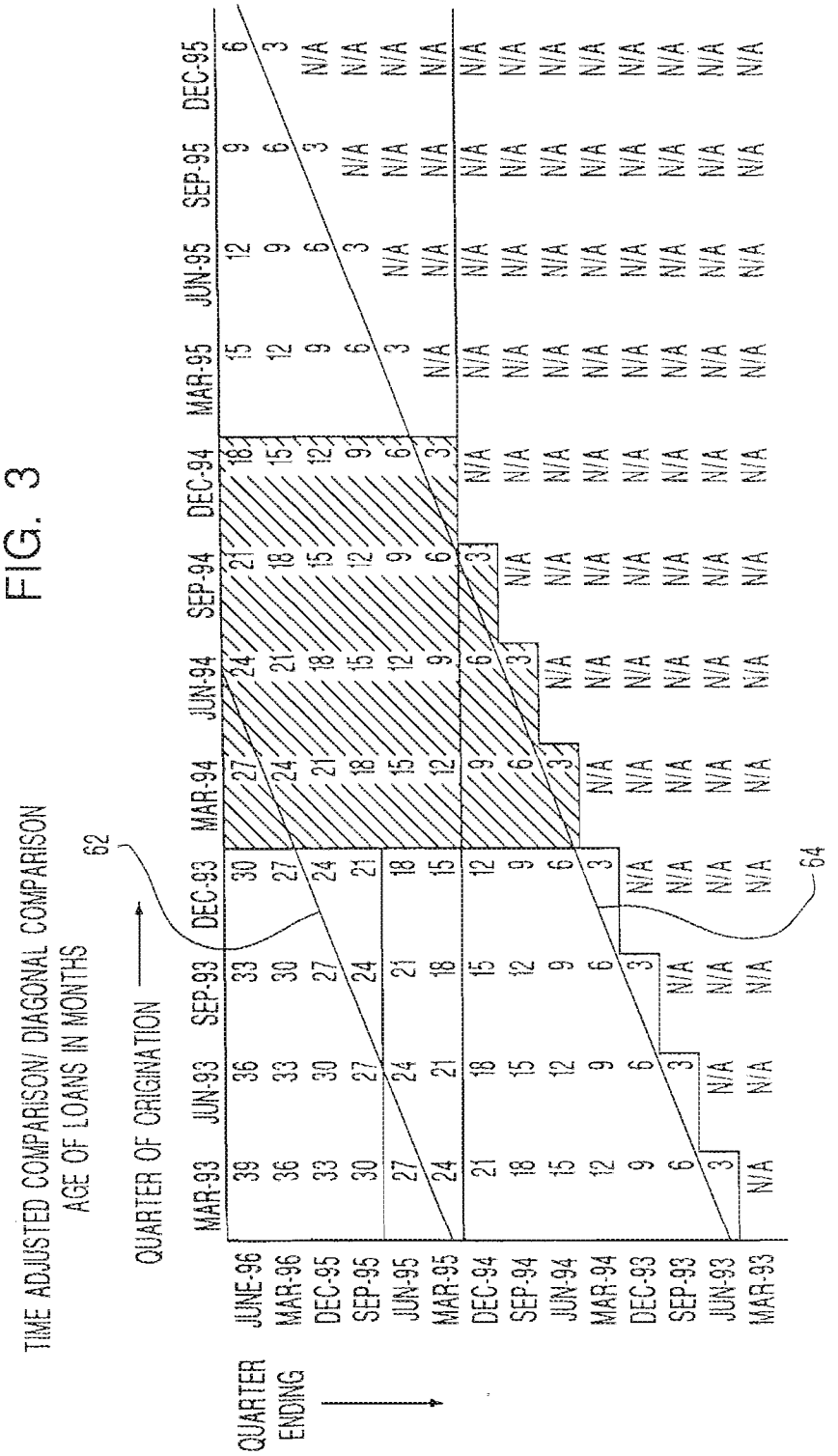

TIME ADJUSTED COMPARISON/ DIAGONAL COMPARISON
AGE OF LOANS IN MONTHS
QUARTER OF ORIGINATION
QUARTER ENDING
62
64
MAR-93 JUN-93 SEP-93 DEC-93 MAR-94 JUN-94 SEP-94 DEC-94 MAR-95 JUN-95 SEP-95 DEC-95
JUNE-96 39 36 33 30 27 24 21 18 15 12 9 6
MAR-96 36 33 30 27 24 21 18 15 12 9 6 3
DEC-95 33 30 27 24 21 18 15 12 9 6 3 N/A
SEP-95 30 27 24 21 18 15 12 9 6 3 N/A N/A
JUN-95 27 24 21 18 15 12 9 6 3 N/A N/A N/A
MAR-95 24 21 18 15 12 9 6 3 N/A N/A N/A N/A
DEC-94 21 18 15 12 9 6 3 N/A N/A N/A N/A N/A
SEP-94 18 15 12 9 6 3 N/A N/A N/A N/A N/A N/A
JUN-94 15 12 9 6 3 N/A N/A N/A N/A N/A N/A N/A
MAR-94 12 9 6 3 N/A N/A N/A N/A N/A N/A N/A N/A
DEC-93 9 6 3 N/A N/A N/A N/A N/A N/A N/A N/A N/A
SEP-93 6 3 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
JUN-93 3 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
MAR-93 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

FIG. 4

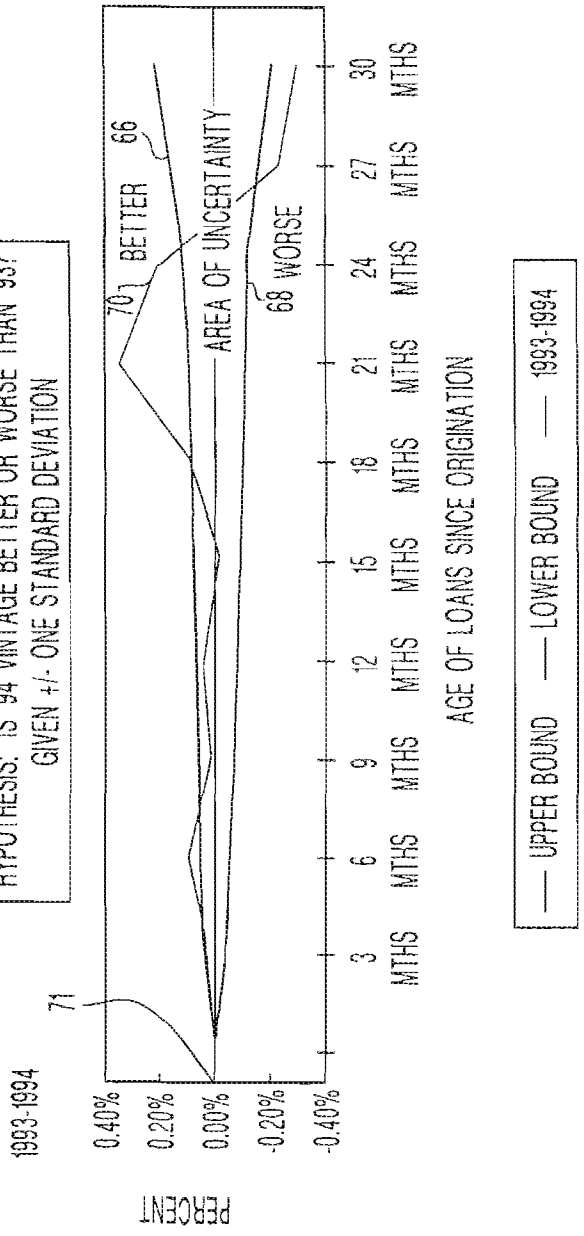

HYPOTHESIS: IS '94 VINTAGE BETTER OR WORSE THAN '93?
GIVEN +/- ONE STANDARD DEVIATION
1993-1994
PERCENT
0.40%
0.20%
0.00%
-0.20%
-0.40%
71
70
BETTER
66
AREA OF UNCERTAINTY
68 WORSE
3 MTHS
6 MTHS
9 MTHS
12 MTHS
15 MTHS
18 MTHS
21 MTHS
24 MTHS
27 MTHS
30 MTHS
AGE OF LOANS SINCE ORIGINATION
UPPER BOUND
LOWER BOUND
1993-1994

FIG. 4A-1

DATA RESULTS EXTRACT OF CALCULATIONS

TOTAL NUMBER OF "BAD" LOANS

ORIGINATION MONTH/YR (AGE →)	3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
MAR-93	2	2	8	6	6	11	29	27	31	28	30	19	24	27
JUN-93	8	5	9	14	7	19	28	41	42	34	20	32	36	
SEP-93	9	16	14	17	31	37	53	36	38	22	27	59		
DEC-93	34	39	30	35	40	45	42	38	22	36	65			
MAR-94	20	19	24	23	26	34	24	13	27	43				
JUN-94	9	7	19	26	48	45	24	34	65					
SEP-94	6	7	13	22	26	17	24	45						
DEC-94	3	11	13	17	9	23	39							
MAR-95	0	7	14	10	16	30								
JUN-95	2	9	11	10	30									
SEP-95	1	2	7	22										
DEC-95	1	2	7											
MAR-96	1	7												
JUN-96	3													

TOTAL NUMBER OF LOANS ("BAD" & "GOOD")

ORIGINATION MONTH/YR (AGE →)	3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
MAR-93	6,350	5,325	4,961	2,243	2,204	2,212	2,232	2,286	2,254	2,201	3,809	1,977	1,578	986
JUN-93	7,305	5,972	3,105	3,060	2,998	3,003	3,109	3,088	3,055	2,712	2,538	2,344	1,325	
SEP-93	7,191	4,022	3,890	3,808	3,786	3,785	3,743	3,743	3,204	3,009	2,898	1,918		
DEC-93	9,712	7,299	6,910	6,719	6,607	6,502	6,395	5,744	5,116	4,711	3,744			
MAR-94	7,784	6,443	6,150	5,970	5,869	5,741	5,307	4,824	4,189	3,448				
JUN-94	5,985	5,634	5,529	5,391	5,098	4,633	4,284	3,951	3,339					
SEP-94	6,540	6,345	6,227	5,271	4,681	4,290	3,994	3,443						
DEC-94	5,979	5,856	5,159	4,653	4,354	4,099	3,626							
MAR-95	3,864	3,313	3,127	2,916	2,772	2,576								
JUN-95	6,322	6,204	5,991	5,791	5,425									
SEP-95	3,546	3,482	3,446	3,091										
DEC-95	3,231	3,271	3,089											
MAR-96	2,401	2,454												
JUN-96	4,173													

FIG. 4A-2

SUM OF 4 QUARTERS

BAD LOANS ORIGINATION MONTH/YR	AGE → 3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
1993	53	62	61	72	84	112	152	142	133	120	142	110	60	27
1994	38	44	69	88	109	119	111	92	92	43	0	0	0	0

ALL LOANS ORIGINATION MONTH/YR	AGE → 3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
1993	30,558	22,618	18,866	15,830	15,595	15,502	15,479	14,861	13,629	12,633	12,989	6,239	2,903	986
1994	26,288	24,278	23,065	21,285	20,002	18,763	17,211	12,218	7,528	3,448	0	0	0	0

BAD RATE ORIGINATION MONTH/YR	AGE → 3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
1993	0.17%	0.27%	0.32%	0.45%	0.54%	0.72%	0.98%	0.96%	0.98%	0.95%	1.09%	1.76%	2.07%	2.74%
1994	0.14%	0.18%	0.30%	0.41%	0.54%	0.63%	0.64%	0.75%	1.22%	1.25%	N/A	N/A	N/A	N/A

STD DEV ORIGINATION MONTH/YR	AGE → 3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
1993	0.02%	0.03%	0.04%	0.05%	0.06%	0.07%	0.08%	0.08%	0.08%	0.08%	0.09%	0.17%	0.26%	0.52%
1994	0.02%	0.03%	0.04%	0.04%	0.05%	0.06%	0.06%	0.08%	0.13%	0.19%				

RATE DIFFERENCE	AGE → 3 MTHS	6 MTHS	9 MTHS	12 MTHS	15 MTHS	18 MTHS	21 MTHS	24 MTHS	27 MTHS	30 MTHS	33 MTHS	36 MTHS	39 MTHS	42 MTHS
1993-1994	0.03%	0.09%	0.02%	0.04%	-0.01%	0.09%	0.34%	0.20%	-0.25%	-0.30%	1.09%	1.76%	2.07%	2.74%
STD DEV	0.03%	0.04%	0.05%	0.07%	0.08%	0.09%	0.10%	0.11%	0.15%	0.21%				
STD DEV	-0.03%	-0.04%	-0.05%	-0.07%	-0.08%	-0.09%	-0.10%	-0.11%	-0.15%	-0.21%				

FIG. 5

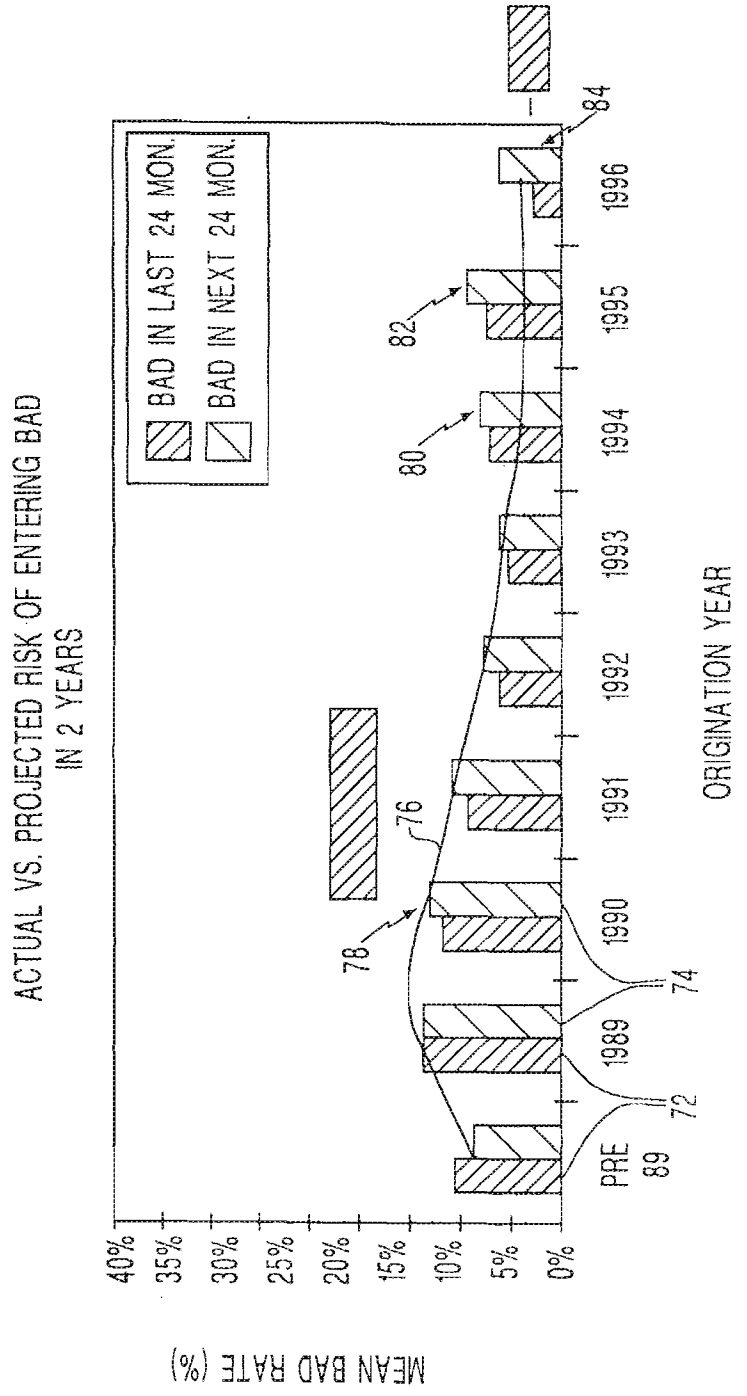

ACTUAL VS. PROJECTED RISK OF ENTERING BAD IN 2 YEARS
BAD IN LAST 24 MON.
BAD IN NEXT 24 MON.
MEAN BAD RATE (%)
40%
35%
30%
25%
20%
15%
10%
5%
0%
PRE 89
1989
1990
1991
1992
1993
1994
1995
1996
ORIGINATION YEAR
72
74
76
78
80
82
84

FIG. 6

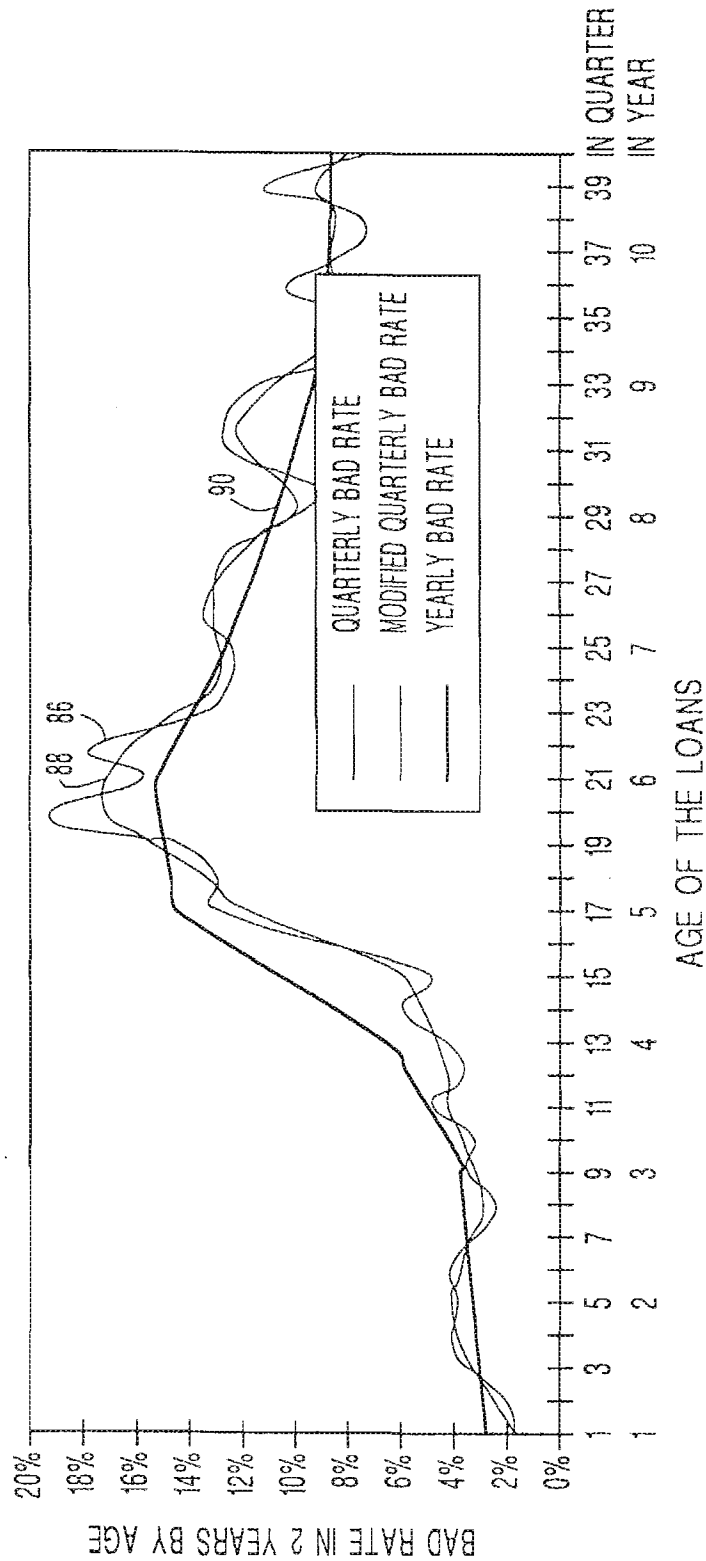


CHART 1: ONE EXAMPLE OF THE BAD RATE CURVE
(DATA IS FOR DEMONSTRATION ONLY)

FIG. 7

ROLL RATE OF DELINQUENCY FOR ONE YEAR

AGE OF LOANS	FROM \ TO	CONFORMING LOANS			JUMBO LOANS			GOVERNMENT LOANS		
		BAD	GOOD	EXIT	BAD	GOOD	EXIT	BAD	GOOD	EXIT
1 YEAR	BAD	43.08%	38.46%	18.46%	28.15%	48.89%	22.96%	69.83%	23.05%	7.11%
	GOOD	0.27%	72.52%	27.21%	0.31%	82.69%	17.01%	1.60%	91.63%	6.77%
2 YEAR	BAD	63.93%	19.17%	16.90%	57.61%	20.58%	21.81%	78.76%	11.76%	9.49%
	GOOD	0.30%	71.00%	28.70%	0.38%	60.63%	18.99%	1.99%	87.77%	10.24%
3 YEAR	BAD	65.78%	14.65%	19.57%	55.04%	11.17%	33.79%	76.28%	7.81%	15.91%
	GOOD	0.46%	72.34%	27.19%	0.58%	79.77%	19.65%	2.48%	84.47%	13.05%
4 YEAR	BAD	55.18%	9.62%	35.20%	39.47%	6.95%	53.57%	75.15%	6.21%	18.63%
	GOOD	1.22%	72.64%	26.13%	1.42%	77.08%	21.50%	3.12%	80.76%	16.11%
5 YEAR	BAD	53.51%	9.36%	37.13%	33.69%	5.79%	60.52%	72.55%	5.97%	21.48%
	GOOD	2.08%	74.66%	23.26%	2.41%	74.15%	23.44%	3.69%	79.72%	16.59%
6 YEAR	BAD	46.57%	8.69%	44.74%	36.48%	4.72%	58.80%	71.73%	6.99%	21.28%
	GOOD	1.55%	75.70%	22.74%	1.36%	71.42%	27.22%	3.64%	78.86%	17.50%
7 YEAR	BAD	65.51%	10.65%	23.84%	56.91%	10.57%	32.52%	69.34%	8.66%	22.00%
	GOOD	1.34%	77.12%	21.54%	1.03%	69.20%	29.76%	2.88%	78.69%	18.42%
8 YEAR	BAD	71.60%	13.12%	15.28%	81.82%	5.19%	12.99%	70.53%	10.67%	18.80%
	GOOD	0.98%	75.85%	23.17%	0.94%	80.49%	18.57%	2.83%	80.61%	16.56%
9 YEAR	BAD	67.03%	14.98%	18.00%	63.64%	21.21%	15.15%	70.88%	11.09%	18.03%
	GOOD	1.00%	74.59%	24.40%	0.54%	81.68%	17.77%	2.48%	83.65%	13.87%
10 YEAR	BAD	62.10%	12.17%	25.73%	83.33%	8.33%	8.33%	73.86%	9.52%	16.61%
	GOOD	0.77%	70.16%	29.06%	2.37%	71.60%	26.04%	2.84%	79.52%	17.64%

FIG. 8

THE CLASSIC ROLL-RATE FORECAST

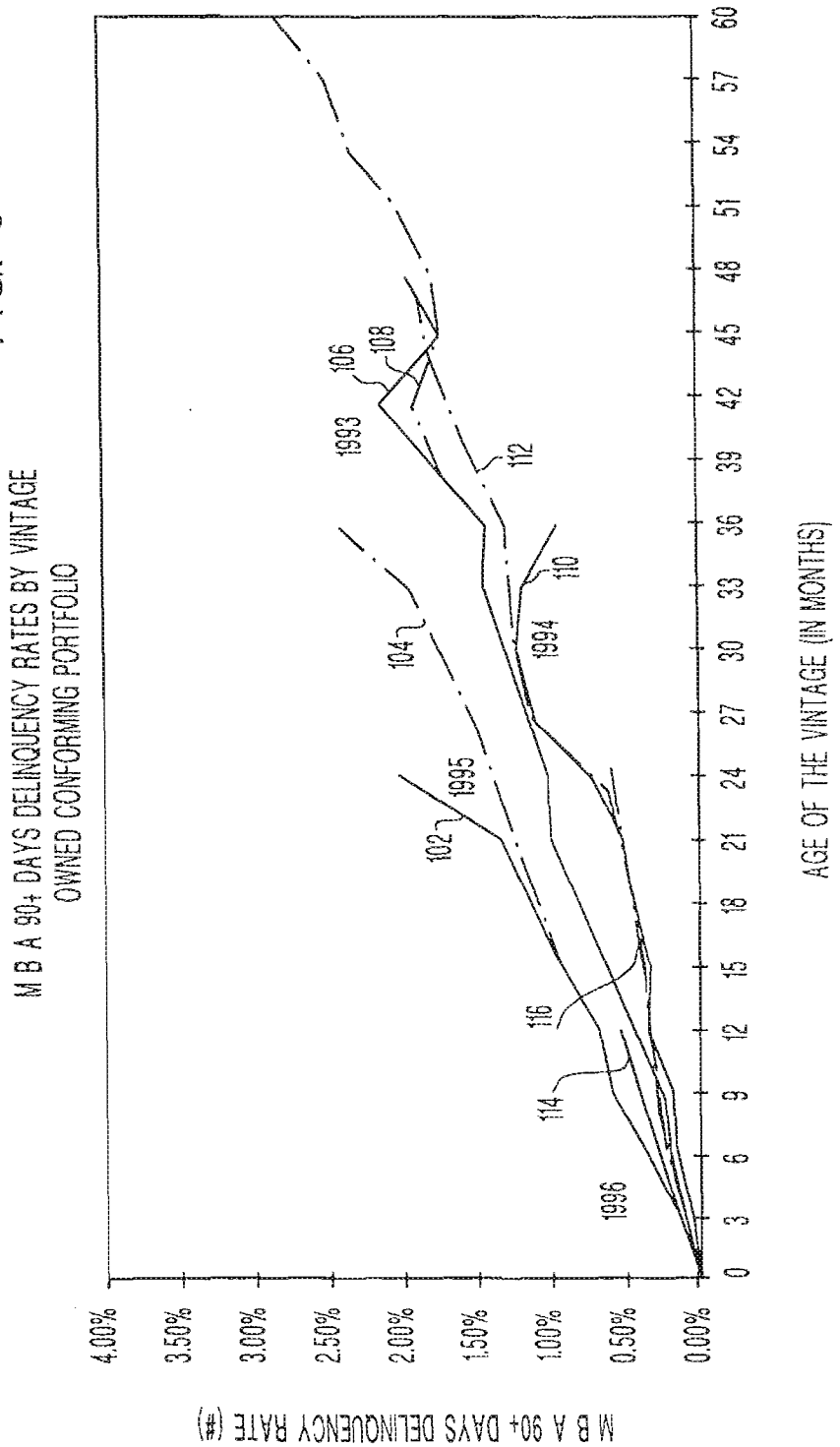
ORIG. QUARTER	CURRENT INFORMATION			ROLL RATE FROM BAD TO		ROLL RATE FROM GOOD TO		INFORMATION AT THE END OF THE NEXT QUARTER (FORECAST)			
	AGE	# OF LOANS	BAD RATE	BAD	EXIT	BAD	EXIT	AGE	NEW # OF LOANS	NEW # OF BAD LOANS	BAD RATE
1Q, 1995	8	N_8	R_8	B(8,1)	E(8,1)	b(8,1)	e(8,1)	9	$N_8*R_8*(1-E(8,1)+$ $N_8*(1-R_8)*(1-e(8,1))$	$N_8*R_8*B(8,1)+$ $N_8*(1-R_8)*b(8,1)$	NEW # OF BAD LOANS / NEW # OF LOANS
2Q, 1995	7	N_7	R_7	B(7,1)	E(7,1)	b(7,1)	e(7,1)	8	$N_7*R_7*(1-E(7,1)+$ $N_7*(1-R_7)*(1-e(7,1))$	$N_7*R_7*B(7,1)+$ $N_7*(1-R_7)*b(7,1)$	NEW # OF BAD LOANS / NEW # OF LOANS
3Q, 1995	6	N_6	R_6	B(6,1)	E(6,1)	b(6,1)	e(6,1)	7	$N_6*R_6*(1-E(6,1)+$ $N_6*(1-R_6)*(1-e(6,1))$	$N_6*R_6*B(6,1)+$ $N_6*(1-R_6)*b(6,1)$	NEW # OF BAD LOANS / NEW # OF LOANS
4Q, 1995	5	N_5	R_5	B(5,1)	E(5,1)	b(5,1)	e(5,1)	6	$N_5*R_5*(1-E(5,1)+$ $N_5*(1-R_5)*(1-e(5,1)$	$N_5*R_5*B(5,1)+$ $N_5*(1-R_5)*b(5,1)$	NEW # OF BAD LOANS / NEW # OF LOANS

NOTE: THE AGE IS IN QUARTERS.

NOTE: THE PARAMETERS IN B(8,1) HAVE THE FOLLOWING MEANING: 8 IS THE AGE (IN QUARTERS), 1 IS THE FORECAST TIME PERIOD (IN QUARTER).

SUBSTITUTE SHEET (RULE 26)

FIG. 9


M B A 90+ DAYS DELINQUENCY RATES BY VINTAGE
OWNED CONFORMING PORTFOLIO
M B A 90+ DAYS DELINQUENCY RATE (#)
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60
AGE OF THE VINTAGE (IN MONTHS)
1993
1994
1995
1996
102
104
106
108
110
112
114
116

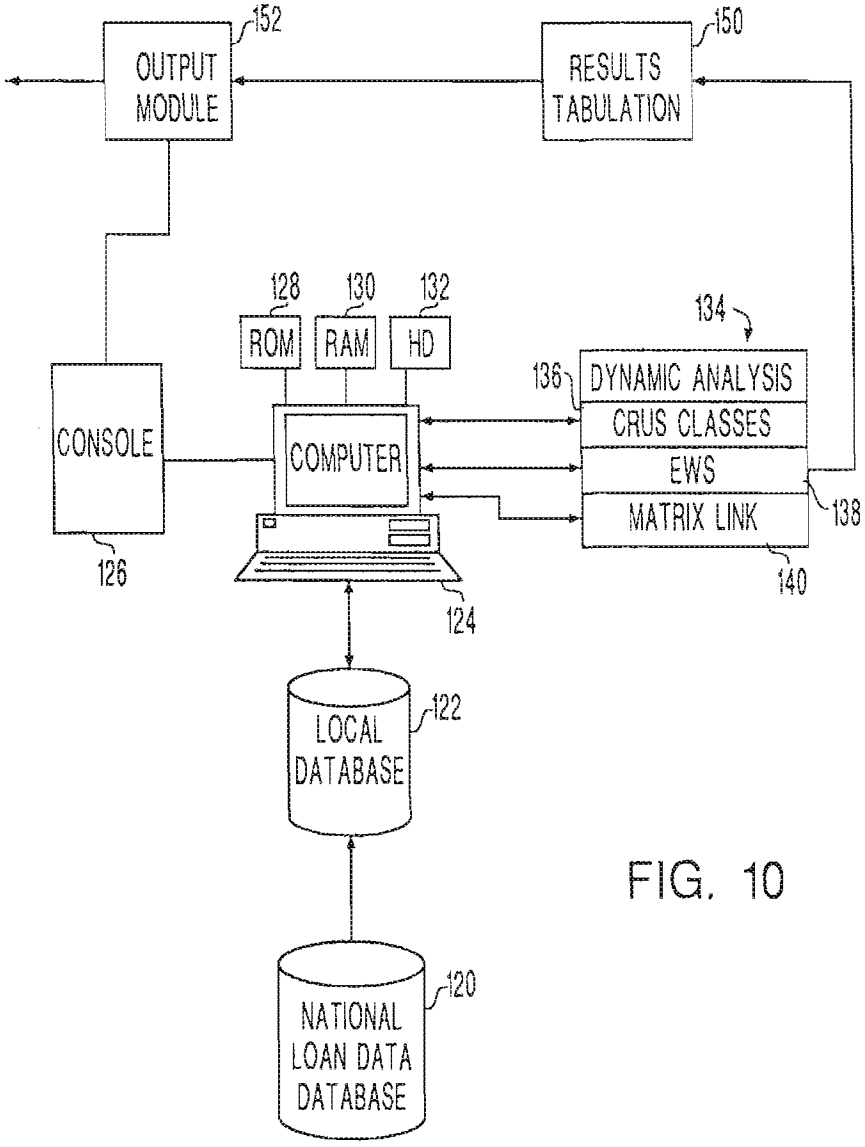

OUTPUT MODULE
152
RESULTS TABULATION
150
ROM
128
RAM
130
HD
132
134
DYNAMIC ANALYSIS
136
CRUS CLASSES
EWS
MATRIX LINK
138
140
CONSOLE
126
COMPUTER
124
LOCAL DATABASE
122
NATIONAL LOAN DATA DATABASE
120

FIG. 10

INTERNATIONAL SEARCH REPORT

Intern ial Application No
PCT/US 98/13195

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F17/60

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G06F

Documentation searched other than minimumdocumentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SMITH L D ET AL: "A comprehensive model for managing credit risk on home mortgage portfolios" DECISION SCIENCES, SPRING 1996, DECISION SCI. INST, USA, vol. 27, no. 2, pages 291-317, XP002078224 ISSN 0011-7315 see abstract see page 292, line 6 see page 293, line 31 - page 294, line 17 see page 294, line 37 - page 295, line 32 see page 306, line 22 - line 28	1-21, 24-37
Y	see figure 2	22,23, 38-40

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publicationdate of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of theinternational search	Date of mailing of the International search report
22 September 1998	07/10/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Pedersen, N

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INTERNATIONAL SEARCH REPORT

Interna[illegible]al Application No
PCT/US 98/13195

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	MATHIESON M: "Ordinal models for neural networks" NEURAL NETWORKS IN FINANCIAL ENGINEERING. PROCEEDINGS OF THE THIRD INTERNATIONAL CONFERENCE ON NEURAL NETWORKS IN THE CAPITAL MARKETS, PROCEEDINGS OF THE 3RD INTERNATIONAL CONFERENCE ON NEURAL NETWORKS IN FINANCIAL ENGINEERING, LONDON, UK., 11 - 13 October 1996, pages 523-536, XP002078225 ISBN 981-02-2480-X, Singapore, World Scientific, Singapore see abstract see page 526, line 12 - line 15 see figure 4(b) ---	22,23
Y	WO 96 06402 A (FINANCIAL MODELS COMPANY INC ;KNOWLES JAMES A (CA); TEDER TOOMAS J) 29 February 1996 see page 1, line 1 - line 6 see page 66, line 12 - line 15 see page 67, line 1 - line 5 ---	38-40
A	PINDER, J. P.: "Decision analysis using multinomial logit models: Mortgage portfolio valuation." JOURNAL OF ECONOMICS AND BUSINESS, vol. 48, no. 1, 1996, pages 67-77, XP002078226 see page 69, line 17 - line 30 see page 71, line 14 - line 35 see figures 2-4 ---	1-40
A	JOHN G H ET AL: "Mortgage data mining" PROCEEDINGS OF THE IEEE/IAFE 1997 COMPUTATIONAL INTELLIGENCE FOR FINANCIAL ENGINEERING (CIFER) (CAT. NO.97TH8304), NY, USA, 24 - 25 March 1997, pages 232-236, XP002078227 ISBN 0-7803-4133-3 see page 232, column 2, line 29 - line 35 see page 234, column 2, line 9 - line 11 see figure 2 --- -/--	1-40

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INTERNATIONAL SEARCH REPORT

Internat al Application No
PCT/US 98/13195

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	DESAI V S ET AL: "A comparison of neural networks and linear scoring models in the credit union environment" EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, 22 NOV. 1996, ELSEVIER, NETHERLANDS, vol. 95, no. 1, pages 24-37, XP002078228 ISSN 0377-2217 see page 24, column 1, line 1 - column 2, line 4 see page 26, column 2, line 38 - page 27, column 1, line 3 see page 31, column 1, line 17 - column 2, line 8 see table 1	1-40

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Interna al Application No
PCT/US 98/13195

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9606402 A	29-02-1996	CA 2130704 A	24-02-1996
		AU 3249395 A	14-03-1996